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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/533,546	05/02/2005	Akira Sakurai	123653	9357
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EXAMINER JACKSON, MONIQUE R				
ART UNIT 1794		PAPER NUMBER		
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/533,546

Applicant(s)

SAKURAI ET AL.

Examiner

Monique R. Jackson

Art Unit

1794

Period for Reply -- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 30 March 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 11-19 and 21-30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 11-19 and 21-30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SI/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(c) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 3/3/09 has been entered.
2. New claim 30 has been added. Claims 11-19 and 21-30 are pending in the application. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claim Rejections - 35 USC § 102

3. Claims 11 and 12 are rejected under 35 U.S.C. 102(b) as being anticipated by Sivertz et al (USPN 3,776,740.) Sivertz et al teach a silver deposition method from a silvering composition such as an ammoniacal silver nitrate solution wherein a preferred reducer can be added to the strong base prior to admixing the strong base with the silvering solution (Abstract.) Sivertz et al teach improved methods of preparing silvering solutions, especially from concentrates of the ingredients, which are less sensitive to process conditions and the sequence of admixture of the reactive ingredients, wherein Sivertz et al specifically teach that component solutions are first formulated as concentrates, to be stored and later diluted at time of use (Col. 1, line 52-Col. 2, line 3.) Sivertz et al teach one aspect of the invention including "methods of mixing the silvering solutions in which, contrary to usual practice, the reducing agent may be pre-mixed with one or more other reactants such as alkali before the final silvering solution is formed" (Col. 2, lines 27-

33.) Sivertz et al teach that any silver composition in which silver is present in the ionic state, and which is sufficiently water soluble for reactive contact with the reducing agent is suitable, teaching that any of the well known silver compounds or salts, inclusion complexes, coordination compounds, and the like may be utilized, with soluble silver salts such as silver nitrate being useful (Col. 3, lines 9-19.) Sivertz et al teach that the preferred ionic silver composition is one in which the silver ion is complexed, preferably with ammonia which forms silver diammine ion with silver nitrate (Col. 3, lines 19-38.) Sivertz et al teach that alkalinity is provided preferably by the presence of a strong base such as an alkali metal hydroxide of which sodium hydroxide is representative (Col. 3, lines 29-40.) Sivertz et al teach that the relative proportions of reactants may vary over a wide range but preferably the molar ratio of the reducer to the silver compound will be about 1:1 to about 2:1; and the ratio of weight ratio of strong base to silver salt is about 1:1 (Col. 3, lines 41-55.) Sivertz et al teach that reaction solutions may be prepared and mixed in various orders such as preparing a first ammoniacal silver nitrate solution and a second solution of strong base and reducer, or including reducer in both solutions; or preparing a first solution of silver nitrate and reducer, a second solution of strong base and ammonium hydroxide complexing reagent, or including reducer in both solutions; or preparing three separate solutions comprising a first solution of conventional reducer, a second solution of strong base and preferred reducer, and a third solution of the silver diammine reactant or ammoniacal silver nitrate solution (Col. 4, lines 1-59.) Sivertz et al teach that in any case, the component solutions after their preparation are brought together just before contact with the substrate to be silvered or sprayed simultaneously with intermixing at the surface of the substrate wherein normally the component solutions are first formulated as concentrates to be stored and

later diluted at time of use (Col. 4, line 57-Col. 5, line 3.) Sivertz et al further teach examples of different mixing options wherein the appropriate weight of sodium hydroxide is provided as a solution of sodium hydroxide in pure water which is then mixed with the other component solutions as taught by Sivertz et al, wherein Sivertz et al specifically teach mixing options in Table II that read upon the claimed invention (Examples; particularly Methods B and D of Table II.) Sivertz et al also teach that various considerations of the reaction may be varied such as the absolute concentrations of the various reactants and the manner in which the silvering solution is applied to the substrate with possible application methods including air-atomizing prior to or simultaneously with intermixing at the surface of the substrate (Col. 4, lines 11-19 and 59-68.)

Claim Rejections - 35 USC § 103

4. Claims 13-19 and 21-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sivertz et al. The teachings of Sivertz et al are discussed above. With regards to instant claims 13 and 30, Sivertz et al do not specifically teach silver carbonate. However, as discussed above, Sivertz et al teach that any silver composition in which silver is present in the ionic state, and which is sufficiently water soluble for reactive contact with the reducing agent is suitable, teaching that any of the well known silver compounds or salts, inclusion complexes, coordination compounds, and the like may be utilized, with soluble silver salts and ammonia complexed silver salts preferred (Col. 3, lines 9-19.) Hence, one having ordinary skill in the art at the time of the invention would have been motivated to utilize silver carbonate, a known functionally equivalent silver compound in the art for producing silver thin coatings as discussed in the prior office action, in place of the silver nitrate in the ammoniacal silver salt solution taught by Sivertz et al. In terms of Claims 14, 21, 22, Sivertz et al teach that the concentrations

of the various component solutions may be varied depending on the nature of the surface to be silvered and other conditions, wherein Sivertz et al also teach that there are upper limits with regards to higher concentrations of silver nitrate and alkali, and the appropriate volume of concentrated ammonia, beyond which there is a rapidly increasing danger of forming an explosive if the sodium hydroxide is mixed with ammoniacal silver nitrate (Col. 7, lines 7-30); for example, Sivertz et al teach that concentrations of 32 grams of silver nitrate, 25 grams of sodium hydroxide, and about 50 cc of concentrated ammonia, each per liter of final reaction mixture is dangerous (Col. 7, lines 17-30.) Sivertz et al teach that the usual practice employs concentrations as shown in Table I which are quite safe (Col. 7, lines 25-30) but also teach that the alternative mixing methods such as methods B, C and D, provide a means for preparing the solutions and applying them in a manner much less likely to produce accidental explosions (Col. 9, lines 13-22.) Though Sivertz et al teach preferred final concentrations, a few example solution concentrations, and suggested upper limit concentrations for safety reasons, Sivertz et al do not specifically teach the mass percent ranges for the silver and sodium in their respective solutions as instantly claimed. However, given these teachings by Sivertz et al, one having ordinary skill in the art at the time of the invention would have been motivated to utilize routine experimentation to determine the optimum concentrations for each reactant solution based upon the desired silver coating, particularly film thickness for a desired end use, wherein a film thickness within the claimed range is typical in the art. With regards to the substrate, though Sivertz et al teach that the silver coating can be applied to various substrates, Sivertz et al do not specifically teach a light transmitting resin substrate, or a resin-primed substrate, as in instant Claims 15-19 and 23-28, and including a protective resin coating over the metal coating.

However, it would have been obvious to one having ordinary skill in the art at the time of the invention to apply the silver coating taught by Sivertz et al to any substrate known in the art to be coated by a silver coating, wherein transparent resin substrates are known in the art to be suitable for such silver mirror coating particularly in the production of silver mirror and hence would have been obvious to one skilled in the art at the time of the invention. Further, one skilled in the art would have been motivated to apply a typical resin primer to the substrate to improve adhesion between the substrate and the metal coating wherein as discussed in the prior office action, a similar resin coating is advantageously provided on the surface of the silver coating to protect the coating from abrasion or damage as is well established in the art.

5. Claims 11-19 and 21-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Aonuma in view of Sivertz et al. As discussed in the prior office action, Aonuma teaches a chemical solution for forming a silver film on a substrate wherein the resulting coated substrate comprises a silver mirror film on the surface of the substrate, and a coated film of transparent resin on the silver film (Abstract; Col. 2; Examples.) Aonuma teaches an aqueous chemical solution for forming a silver mirror layer on a substrate, such as a transparent glass substrate, wherein Aonuma teaches that the chemical solution comprises: (1) an ammoniac silver nitrate solution; (2) a reducing solution containing a reducing agent and a base component such as sodium hydroxide (*reads upon claimed caustic soda*); and (3) an additive containing a compound of a polyvalent metal contained in at least one of the ammoniac silver nitrate solution and the reducing solution (Abstract.) Aonuma teaches that the process of forming the silver film includes (a) bringing a hydrochloric acid acidified stannous chloride solution into contact with a surface of the substrate, thereby conducting a pretreatment of the surface; (b) bringing another

ammoniac silver nitrate solution into contact with the surface of the substrate; and (c) bringing the ammoniac silver nitrate solution into contact with the reducing solution, on the surface of the substrate, thereby forming the silver film (Abstract.) Aonuma teaches that the nitrate solution and reducing solution are simultaneously sprayed and mixed on the transparent glass substrate (Col. 2, lines 24-30.) Aonuma teaches that a suitable additive can be bismuth carbonate, or other Bi(III) compounds and further teaches examples wherein the amount of silver in the nitrate solutions falls within the claimed range (Col. 2, lines 62-65.) Though Aonuma teaches the use of the same aqueous solutions in forming the silver film as in the instant invention, Aonuma does not specifically teach that the solutions are coated onto the object “immediately after mixing the caustic soda and the reducing agent” however from the teachings of Aonuma, it appears as if the solutions of the examples are mixed during the experimental examples and given that Aonuma does not teach any other intermediate steps, it would have been obvious to one having ordinary skill in the art that the solutions were simultaneously sprayed “immediately” after forming the solutions, particularly since it would have been obvious that the final silver reaction would be affected by the reactivity of the solutions, which may diminish over time. Further, Aonuma does not teach the use of an ammoniacal silver carbonate solution however an aqueous solution of ammoniacal silver carbonate is a known, conventional solution utilized in producing silver thin coatings wherein silver carbonate is typically an intermediate compound resulting from the reaction of silver nitrate with a carbonate compound prior to reduction to the silver coating, as well as a functionally equivalent silver salt compound. Hence, it would have been obvious to one having ordinary skill in the art at the time of the invention to further mix other silver salt solutions such as silver carbonate with the solutions taught by Aonuma, in any mixing order,

wherein one skilled in the art at the time of the invention would have been motivated to utilize routine experimentation to determine the optimum amount of sodium and silver in the solutions, with typical amounts falling within the claimed ranges as taught by Aonuma and would result in a silver thickness within the claimed range. Additionally, though Aonuma utilizes solid NaOH added to the aqueous reducing solution, one having ordinary skill in the art at the time of the invention would have been motivated to add the base component, namely the NaOH, as either a solid or as an equivalent concentrated aqueous solution, given that the final mixture is an aqueous solution comprising both the NaOH and the reducing agent, wherein Sivertz et al teach a similar reactive silver coating method and specifically teach that the components such as NaOH may be provided as concentrated solutions to be stored and then later diluted at the time of use (Col. 4, line 59-Col. 5, line 3.) Hence, the instantly claimed “storing” step would have been obvious to one having ordinary skill in the art at the time of the invention given the teachings of Aonuma in view of Sivertz et al, wherein Sivertz et al also teach that the mixing order can be varied depending upon the type of reducing agents utilized. Lastly, though Aonuma teaches pretreatment of the substrate to improve adhesion of the silver film to the substrate, Aonuma does not specifically teach a resin primer layer, however, it is well established in the art that a primer layer, such as a primer comprising an acrylic or alkyd or resin similar to the resin utilized as a protective coating taught by Aonuma to reduce the number of coating compositions needed, can be applied between the substrate and silver layer to improve adhesion.

Response to Arguments

6. Applicant's arguments with respect to claims 11-19 and 21-30 have been considered but are moot in view of the new ground(s) of rejection.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Monique R. Jackson whose telephone number is 571-272-1508. The examiner can normally be reached on Mondays-Thursdays, 10:00AM-5:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Callie Shosho can be reached on 571-272-1123. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Monique R Jackson/
Primary Examiner, Art Unit 1794
June 7, 2009